

SEQUENCE LISTING

<110> American Home Products
 Wolfman, Neil M.
 Khor, Soo Peang

<120> Modified and Stabilized GDF Propeptides and Uses Thereof

<130> 01997.002000

<140> Not-Yet-Assigned

<141> 2001-01-30

<150> US 60/267,509

<151> 2001-02-08

<160> 16

<170> PatentIn version 3.1

<210> 1

<211> 375

<212> PRT

<213> Homo sapiens

<400> 1

Met Gln Lys Leu Gln Leu Cys Val Tyr Ile Tyr Leu Phe Met Leu Ile
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Val Ala Gly Pro Val Asp Leu Asn Glu Asn Ser Glu Gln Lys Glu Asn
 20 25 30

Val Glu Lys Glu Gly Leu Cys Asn Ala Cys Thr Trp Arg Gln Asn Thr
 35 40 45

Lys Ser Ser Arg Ile Glu Ala Ile Lys Ile Gln Ile Leu Ser Lys Leu
 50 55 60

Arg Leu Glu Thr Ala Pro Asn Ile Ser Lys Asp Val Ile Arg Gln Leu
 65 70 75 80

Leu Pro Lys Ala Pro Pro Leu Arg Glu Leu Ile Asp Gln Tyr Asp Val
 85 90 95

Gln	Arg	Asp	Asp	Ser	Ser	Asp	Gly	Ser	Leu	Glu	Asp	Asp	Asp	Tyr	His		
		100						105					110				
Ala	Thr	Thr	Glu	Thr	Ile	Ile	Thr	Met	Pro	Thr	Glu	Ser	Asp	Phe	Leu		
		115					120					125					
Met	Gln	Val	Asp	Gly	Lys	Pro	Lys	Cys	Cys	Phe	Phe	Lys	Phe	Ser	Ser		
	130					135					140						
Lys	Ile	Gln	Tyr	Asn	Lys	Val	Val	Lys	Ala	Gln	Leu	Trp	Ile	Tyr	Leu		
145					150					155					160		
Arg	Pro	Val	Glu	Thr	Pro	Thr	Thr	Val	Phe	Val	Gln	Ile	Leu	Arg	Leu		
				165					170					175			
Ile	Lys	Pro	Met	Lys	Asp	Gly	Thr	Arg	Tyr	Thr	Gly	Ile	Arg	Ser	Leu		
			180					185					190				
Lys	Leu	Asp	Met	Asn	Pro	Gly	Thr	Gly	Ile	Trp	Gln	Ser	Ile	Asp	Val		
		195				200					205						
Lys	Thr	Val	Leu	Gln	Asn	Trp	Leu	Lys	Gln	Pro	Glu	Ser	Asn	Leu	Gly		
	210					215					220						
Ile	Glu	Ile	Lys	Ala	Leu	Asp	Glu	Asn	Gly	His	Asp	Leu	Ala	Val	Thr		
225					230					235					240		
Phe	Pro	Gly	Pro	Gly	Glu	Asp	Gly	Leu	Asn	Pro	Phe	Leu	Glu	Val	Lys		
				245					250					255			
Val	Thr	Asp	Thr	Pro	Lys	Arg	Ser	Arg	Arg	Asp	Phe	Gly	Leu	Asp	Cys		
			260					265					270				
Asp	Glu	His	Ser	Thr	Glu	Ser	Arg	Cys	Cys	Arg	Tyr	Pro	Leu	Thr	Val		
	275						280					285					
Asp	Phe	Glu	Ala	Phe	Gly	Trp	Asp	Trp	Ile	Ile	Ala	Pro	Lys	Arg	Tyr		
	290					295					300						

Lys Ala Asn Tyr Cys Ser Gly Glu Cys Glu Phe Val Phe Leu Gln Lys
 305 310 315 320

Tyr Pro His Thr His Leu Val His Gln Ala Asn Pro Arg Gly Ser Ala
 325 330 335

Gly Pro Cys Cys Thr Pro Thr Lys Met Ser Pro Ile Asn Met Leu Tyr
 340 345 350

Phe Asn Gly Lys Glu Gln Ile Ile Tyr Gly Lys Ile Pro Ala Met Val
 355 360 365

Val Asp Arg Cys Gly Cys Ser
 370 375

<210> 2
 <211> 1125
 <212> DNA
 <213> Homo sapiens

<400> 2
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 120

gcatgtactt ggagacaaaa cactaaatct tcaagaatag aagccattaa gatacaaatc
 180

ctcagtaaac ttcgtctgga aacagctcct aacatcagca aagatgttat aagacaactt
 240

ttacccaaag ctctccact ccgggaactg attgatcagt atgatgtcca gagggatgac
 300

agcagcgatg gctctttgga agatgacgat tatcacgcta caacggaaac aatcattacc
 360

atgcctacag agtctgattt tctaattgcaa gtggatggaa aacccaaatg ttgcttcttt
 420

aaatttagct ctaaaataca atacaataaa gtagtaaagg cccaactatg gatatatattg
 480

agacccgtcg agactcctac aacagtgttt gtgcaaattcc tgagactcat caaacctatg
540

aaagacggta caaggtatac tggaatccga tctctgaaac ttgacatgaa cccaggcact
600

ggtatttggc agagcattga tgtgaagaca gtgttgcaaa attggctcaa acaacctgaa
660

tccaacttag gcattgaaat aaaagcttta gatgagaatg gtcattgatct tgctgtaacc
720

ttcccaggac caggagaaga tgggctgaat ccgttttttag aggtcaaggt aacagacaca
780

ccaaaaagat ccagaaggga ttttggctctt gactgtgatg agcactcaac agaattcacga
840

tgctgtcggt accctctaac tgtggatttt gaagcttttg gatgggattg gattatcgct
900

cctaaaagat ataaggccaa ttactgctct ggagagtgtg aatttgtatt ttacaaaaa
960

tatcctcata ctcatctggt acaccaagca aaccccagag gttcagcagg cccttgctgt 1
020

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080

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<210> 3

<211> 109

<212> PRT

<213> Homo sapiens

<400> 3

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Arg Tyr Pro Leu Thr Val Asp Phe Glu Ala Phe Gly Trp Asp Trp Ile
20 25 30

Ile Ala Pro Lys Arg Tyr Lys Ala Asn Tyr Cys Ser Gly Glu Cys Glu
35 40 45

Phe Val Phe Leu Gln Lys Tyr Pro His Thr His Leu Val His Gln Ala
50 55 60

Asn Pro Arg Gly Ser Ala Gly Pro Cys Cys Thr Pro Thr Lys Met Ser
65 70 75 80

Pro Ile Asn Met Leu Tyr Phe Asn Gly Lys Glu Gln Ile Ile Tyr Gly
85 90 95

Lys Ile Pro Ala Met Val Val Asp Arg Cys Gly Cys Ser
100 105

<210> 4
<211> 327
<212> DNA
<213> Homo sapiens

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120

aattactgct ctggagagtg tgaatttgta tttttacaaa aatatacctca tactcatctg
180

gtacaccaag caaacccag aggttcagca ggccttgct gtactccac aaagatgtct
240

ccaattaata tgctatatatt taatggcaaa gaacaaataa tatatgggaa aattccagcg
300

atggtagtag accgctgtgg gtgctca
327

<210> 5
<211> 243
<212> PRT
<213> Homo sapiens

<400> 5

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Ile Lys Ile Gln Ile Leu Ser Lys Leu Arg Leu Glu Thr Ala Pro Asn	35	40	45
Ile Ser Lys Asp Val Ile Arg Gln Leu Leu Pro Lys Ala Pro Pro Leu	50	55	60
Arg Glu Leu Ile Asp Gln Tyr Asp Val Gln Arg Asp Asp Ser Ser Asp	65	70	75
Gly Ser Leu Glu Asp Asp Asp Tyr His Ala Thr Thr Glu Thr Ile Ile	85	90	95
Thr Met Pro Thr Glu Ser Asp Phe Leu Met Gln Val Asp Gly Lys Pro	100	105	110
Lys Cys Cys Phe Phe Lys Phe Ser Ser Lys Ile Gln Tyr Asn Lys Val	115	120	125
Val Lys Ala Gln Leu Trp Ile Tyr Leu Arg Pro Val Glu Thr Pro Thr	130	135	140
Thr Val Phe Val Gln Ile Leu Arg Leu Ile Lys Pro Met Lys Asp Gly	145	150	155
Thr Arg Tyr Thr Gly Ile Arg Ser Leu Lys Leu Asp Met Asn Pro Gly	165	170	175
Thr Gly Ile Trp Gln Ser Ile Asp Val Lys Thr Val Leu Gln Asn Trp	180	185	190
Leu Lys Gln Pro Glu Ser Asn Leu Gly Ile Glu Ile Lys Ala Leu Asp	195	200	205

Glu Asn Gly His Asp Leu Ala Val Thr Phe Pro Gly Pro Gly Glu Asp
 210 215 220

Gly Leu Asn Pro Phe Leu Glu Val Lys Val Thr Asp Thr Pro Lys Arg
 225 230 235 240

Ser Arg Arg

<210> 6
 <211> 729
 <212> DNA
 <213> Homo sapiens

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tggagacaaa acactaaatc ttcaagaata gaagccatta agatacaaat cctcagtaaa
 120

cttcgtcttg aaacagctcc taacatcagc aaagatgtta taagacaact tttacccaaa
 180

gctcctccac tccgggaact gattgatcag tatgatgtcc agagggatga cagcagcgat
 240

ggctcttttg aagatgacga ttatcacgct acaacggaaa caatcattac catgcctaca
 300

gagtctgatt ttctaatagca agtggatgga aaacccaaat gttgcttctt taaatttagc
 360

tctaaaatac aatacaataa agtagtaaag gcccaactat ggatatattt gagaccgctc
 420

gagactccta caacagtgtt tgtgcaaata ctgagactca tcaaactat gaaagacggt
 480

acaaggtata ctggaatccg atctctgaaa cttgacatga acccaggcac tggattttgg
 540

cagagcattg atgtgaagac agtgttgcaa aattggctca aacaacctga atccaactta
 600

ggcattgaaa taaaagcttt agatgagaat ggtcatgatc ttgctgtaac cttcccagga
 660

ccaggagaag atgggctgaa tccgttttta gaggtcaagg taacagacac accaaaaaga
720

tccagaagg
729

<210> 7
<211> 407
<212> PRT
<213> Homo sapiens

<400> 7

Met Val Leu Ala Ala Pro Leu Leu Leu Gly Phe Leu Leu Leu Ala Leu
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Glu Leu Arg Pro Arg Gly Glu Ala Ala Glu Gly Pro Ala Ala Ala Ala
20 25 30

Ala Ala Ala Ala Ala Ala Ala Ala Ala Gly Val Gly Gly Glu Arg Ser
35 40 45

Ser Arg Pro Ala Pro Ser Val Ala Pro Glu Pro Asp Gly Cys Pro Val
50 55 60

Cys Val Trp Arg Gln His Ser Arg Glu Leu Arg Leu Glu Ser Ile Lys
65 70 75 80

Ser Gln Ile Leu Ser Lys Leu Arg Leu Lys Glu Ala Pro Asn Ile Ser
85 90 95

Arg Glu Val Val Lys Gln Leu Leu Pro Lys Ala Pro Pro Leu Gln Gln
100 105 110

Ile Leu Asp Leu His Asp Phe Gln Gly Asp Ala Leu Gln Pro Glu Asp
115 120 125

Phe Leu Glu Glu Asp Glu Tyr His Ala Thr Thr Glu Thr Val Ile Ser
130 135 140

Met Ala Gln Glu Thr Asp Pro Ala Val Gln Thr Asp Gly Ser Pro Leu

145					150						155					160
Cys	Cys	His	Phe	His	Phe	Ser	Pro	Lys	Val	Met	Phe	Thr	Lys	Val	Leu	
				165					170					175		
Lys	Ala	Gln	Leu	Trp	Val	Tyr	Leu	Arg	Pro	Val	Pro	Arg	Pro	Ala	Thr	
			180					185					190			
Val	Tyr	Leu	Gln	Ile	Leu	Arg	Leu	Lys	Pro	Leu	Thr	Gly	Glu	Gly	Thr	
		195					200					205				
Ala	Gly	Gly	Gly	Gly	Gly	Gly	Arg	Arg	His	Ile	Arg	Ile	Arg	Ser	Leu	
	210						215				220					
Lys	Ile	Glu	Leu	His	Ser	Arg	Ser	Gly	His	Trp	Gln	Ser	Ile	Asp	Phe	
225					230					235					240	
Lys	Gln	Val	Leu	His	Ser	Trp	Phe	Arg	Gln	Pro	Gln	Ser	Asn	Trp	Gly	
				245					250					255		
Ile	Glu	Ile	Asn	Ala	Phe	Asp	Pro	Ser	Gly	Thr	Asp	Leu	Ala	Val	Thr	
			260					265					270			
Ser	Leu	Gly	Pro	Gly	Ala	Glu	Gly	Leu	His	Pro	Phe	Met	Glu	Leu	Arg	
		275					280					285				
Val	Leu	Glu	Asn	Thr	Lys	Arg	Ser	Arg	Arg	Asn	Leu	Gly	Leu	Asp	Cys	
	290					295					300					
Asp	Glu	His	Ser	Ser	Glu	Ser	Arg	Cys	Cys	Arg	Tyr	Pro	Leu	Thr	Val	
305					310					315					320	
Asp	Phe	Glu	Ala	Phe	Gly	Trp	Asp	Trp	Ile	Ile	Ala	Pro	Lys	Arg	Tyr	
				325					330					335		
Lys	Ala	Asn	Tyr	Cys	Ser	Gly	Gln	Cys	Glu	Tyr	Met	Phe	Met	Gln	Lys	
			340					345					350			

Tyr Pro His Thr His Leu Val Gln Gln Ala Asn Pro Arg Gly Ser Ala
 355 360 365

Gly Pro Cys Cys Thr Pro Thr Lys Met Ser Pro Ile Asn Met Leu Tyr
 370 375 380

Phe Asn Asp Lys Gln Gln Ile Ile Tyr Gly Lys Ile Pro Gly Met Val
 385 390 395 400

Val Asp Arg Cys Gly Cys Ser
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<210> 8

<211> 1221

<212> DNA

<213> Homo sapiens

<400> 8

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 120

gcgggggtcg ggggggagcg ctccagccgg ccagccccgt ccgtggcgcc cgagccggac
 180

ggctgccccg tgtgcgtttg gcggcagcac agccgcgagc tgcgcctaga gagcatcaag
 240

tcgcagatct tgagcaaact ggggtcaag gaggcgcca acatcagccg cgaggtggtg
 300

aagcagctgc tgcccaaggc gccgccgtg cagcagatcc tggacctaca cgacttccag
 360

ggcgacgcgc tgcagcccga ggacttctg gaggaggacg agtaccacgc caccaccgag
 420

accgtcatta gcatggccca ggagacggac ccagcagtac agacagatgg cagccctctc
 480

tgctgccatt ttacttcag cccaaggtg atgttcacaa aggtactgaa ggcccagctg
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tgggtgtacc tacggcctgt accccgcca gccacagtct acctgcagat cttgcgacta
 600

aaacccttaa ctggggaagg gaccgcaggg ggagggggcg gaggccggcg tcacatccgt
660

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720

aagcaagtgc tacacagctg gttccgccag ccacagagca actggggcat cgagatcaac
780

gcctttgatc ccagtggcac agacctggct gtcacctccc tggggccggg agccgagggg
840

ctgcatccat tcatggagct tcgagtccta gagaacacaa aacgttcccg gcggaacctg
900

ggtctggact gcgacgagca ctcaagcgag tcccgtgtgt gccgatatcc cctcacagtg
960

gactttgagg ctttcggctg ggactggatc atcgcaccta agcgctacaa ggccaactac 1
020

tgctccggcc agtgcgagta catgttcatg caaaaatatc cgcataccca tttggtgcag 1
080

caggccaatc caagaggctc tgctggggccc tgttgtaccc ccaccaagat gtccccaatc 1
140

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200

gtggatcgct gtggctgctc t 1
221

<210> 9
<211> 109
<212> PRT
<213> Homo sapiens

<400> 9

Asn Leu Gly Leu Asp Cys Asp Glu His Ser Ser Glu Ser Arg Cys Cys
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Arg Tyr Pro Leu Thr Val Asp Phe Glu Ala Phe Gly Trp Asp Trp Ile
20 25 30

Ile Ala Pro Lys Arg Tyr Lys Ala Asn Tyr Cys Ser Gly Gln Cys Glu

35

40

45

Tyr Met Phe Met Gln Lys Tyr Pro His Thr His Leu Val Gln Gln Ala
 50 55 60

Asn Pro Arg Gly Ser Ala Gly Pro Cys Cys Thr Pro Thr Lys Met Ser
 65 70 75 80

Pro Ile Asn Met Leu Tyr Phe Asn Asp Lys Gln Gln Ile Ile Tyr Gly
 85 90 95

Lys Ile Pro Gly Met Val Val Asp Arg Cys Gly Cys Ser
 100 105

<210> 10
 <211> 327
 <212> DNA
 <213> Homo sapiens

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 120

aactactgct ccggccagtg cgagtacatg ttcatgcaaa aatatccgca taccatttg
 180

gtgcagcagg ccaatccaag aggctctgct gggccctgtt gtacccccac caagatgtcc
 240

ccaatcaaca tgctctactt caatgacaag cagcagatta tctacggcaa gatccctggc
 300

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<210> 11
 <211> 274
 <212> PRT
 <213> Homo sapiens

<400> 11

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20 25 30

Pro Glu Pro Asp Gly Cys Pro Val Cys Val Trp Arg Gln His Ser Arg
35 40 45

Glu Leu Arg Leu Glu Ser Ile Lys Ser Gln Ile Leu Ser Lys Leu Arg
50 55 60

Leu Lys Glu Ala Pro Asn Ile Ser Arg Glu Val Val Lys Gln Leu Leu
65 70 75 80

Pro Lys Ala Pro Pro Leu Gln Gln Ile Leu Asp Leu His Asp Phe Gln
85 90 95

Gly Asp Ala Leu Gln Pro Glu Asp Phe Leu Glu Glu Asp Glu Tyr His
100 105 110

Ala Thr Thr Glu Thr Val Ile Ser Met Ala Gln Glu Thr Asp Pro Ala
115 120 125

Val Gln Thr Asp Gly Ser Pro Leu Cys Cys His Phe His Phe Ser Pro
130 135 140

Lys Val Met Phe Thr Lys Val Leu Lys Ala Gln Leu Trp Val Tyr Leu
145 150 155 160

Arg Pro Val Pro Arg Pro Ala Thr Val Tyr Leu Gln Ile Leu Arg Leu
165 170 175

Lys Pro Leu Thr Gly Glu Gly Thr Ala Gly Gly Gly Gly Gly Gly Arg
180 185 190

Arg His Ile Arg Ile Arg Ser Leu Lys Ile Glu Leu His Ser Arg Ser
195 200 205

Gly His Trp Gln Ser Ile Asp Phe Lys Gln Val Leu His Ser Trp Phe
 210 215 220

Arg Gln Pro Gln Ser Asn Trp Gly Ile Glu Ile Asn Ala Phe Asp Pro
 225 230 235 240

Ser Gly Thr Asp Leu Ala Val Thr Ser Leu Gly Pro Gly Ala Glu Gly
 245 250 255

Leu His Pro Phe Met Glu Leu Arg Val Leu Glu Asn Thr Lys Arg Ser
 260 265 270

Arg Arg

<210> 12
 <211> 822
 <212> DNA
 <213> Homo sapiens

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 120

tgcgtttgcc ggcagcacag ccgcgagctg cgcctagaga gcatcaagtc gcagatcttg
 180

agcaaactgc ggctcaagga ggcgcccac atcagccgcg aggtgggtgaa gcagctgctg
 240

cccaaggcgc cgccgctgca gcagatcctg gacctacacg acttccaggg cgacgcgctg
 300

cagcccaggg acttcctgga ggaggacgag taccacgcca ccaccgagac cgtcattagc
 360

atggcccagg agacggaccc agcagtacag acagatggca gccctctctg ctgccatttt
 420

cacttcagcc ccaaggatgat gttcacaag gtactgaagg ccagctgtg ggtgtaccta
 480

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600

aagattgagc tgcactcacg ctgaggccat tggcagagca tgcacttcaa gcaagtgcta
660

cacagctggg tccgccagcc acagagcaac tggggcatcg agatcaacgc ctttgatccc
720

agtggcacag acctggctgt cacctccctg gggccgggag ccgaggggct gcatccattc
780

atggagcttc gaggcctaga gaacacaaaa cggtcccggc gg
822

<210> 13
<211> 23
<212> PRT
<213> Homo sapiens

<400> 13

Met	Gln	Lys	Leu	Gln	Leu	Cys	Val	Tyr	Ile	Tyr	Leu	Phe	Met	Leu	Ile
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Val	Ala	Gly	Pro	Val	Asp	Leu
			20			

<210> 14
<211> 24
<212> PRT
<213> Homo sapiens

<400> 14

Met	Val	Leu	Ala	Ala	Pro	Leu	Leu	Leu	Gly	Phe	Leu	Leu	Leu	Ala	Leu
1				5					10					15	

Glu	Leu	Arg	Pro	Arg	Gly	Glu	Ala
			20				

<210> 15
<211> 232

<212> PRT
 <213> Homo sapiens

<400> 15

Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala
 1 5 10 15

Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro
 20 25 30

Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val
 35 40 45

Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val
 50 55 60

Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln
 65 70 75 80

Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln
 85 90 95

Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala
 100 105 110

Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro
 115 120 125

Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr
 130 135 140

Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser
 145 150 155 160

Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr
 165 170 175

Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr
 180 185 190

Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe
195 200 205

Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys
210 215 220

Ser Leu Ser Leu Ser Pro Gly Lys
225 230

<210> 16
<211> 227
<212> PRT
<213> Homo sapiens

<400> 16

Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Ala Leu Gly
1 5 10 15

Ala Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met
20 25 30

Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His
35 40 45

Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val
50 55 60

His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr
65 70 75 80

Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly
85 90 95

Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile
100 105 110

Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val
115 120 125

Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser
 130 135 140

Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu
 145 150 155 160

Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro
 165 170 175

Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val
 180 185 190

Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met
 195 200 205

His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser
 210 215 220

Pro Gly Lys
 225